DATA STRUCTURE - ALGORITHMS ROADMAP

Table Of Contents

WEEK 1

❖ **Content**
- Array
- String

❖ **List of problems**

Object	Problem Number	Title
CodeChef	COMPILER	Compilers and parsers
CodeForces	518A	Vitaly and Strings
CodeForces	892B	Wrath
CodeForces	731A	Night at the Museum
CodeForces	721B	Passwords
UVA	10583	Ubiquitous Religions
CodeForces	572A	Arrays
CodeForces	279B	Books
CodeForces	673A	Bear and Game

❖ **Link contest**
- ✓ *Link*

WEEK 2 + 3

❖ **Content**
- *Data Structures*
  - Linked List
  - Stack
  - Queue
- *Algorithm Sorting*
  - Selection sort
  - Insertion sort
  - Bubble sort
  - Merge sort
  - Quick sort

❖ **List of problems**

Linked List	[Ex1](#)
	[Ex2](#)
	[Ex3](#)
	[Ex4](#)
	[Ex5](#)
	[Ex6](#)
	[Ex7](#)

Stack & Queue	*Object*	*Problem Number*	*Titles*
	CodeForces	644B	Processing Queries
	HackerRank		Queue using Two Stacks
	SPOJ	MMASS	Mass of Molecule
	CodeForces	STPAR	Street Parade
	CodeForces	520A	Pangram

Sorting	*Object*	*Problem Number*	*Titles*
	CodeForces	471B	MUH and Important Things
	CodeForces	721B	Passwords
	CodeForces	448B	Suffix Structures
	HackerRank		Closest Numbers

❖ **Link contest**
- ✓ *[Link](#)*

❖ **References**
- *[Linked List](#)*

- *Stack*
- *Queue*
- *Sorting*

WEEK 4

❖ **Content**
- *Algorithm Searching*
  + Linear search
  + Binary search

❖ **List of problems**

Object	Problem Number	Titles
CodeChef	FSQRT	Finding Square Roots
SPOJ	EKO	Eko
SPOJ	HACKRNDM	Hacking the random number generator
SPOJ	OPCPIZZA	Pizzamania
UVA	10341	Solve It
UVA	10474	Where is the Marble?
UVA	10611	The Playboy Chimp
UVA	12032	The Monkey and the Oiled Bamboo

❖ **Link contest**
- ✓ *Link*

❖ **References**
  + *Binary Search*
  + *Linear Search*

WEEK 5 + 6

❖ **Content**

- *Algorithm find path in the unweighted graph*
    - Breadth First Search (BFS)
    - Depth First Search (DFS)

❖ **List of problems**

BFS	Object	Problem Number	Titles
	CodeForces	540C	Ice Cave
	CodeForces	580C	Kefa and Park
	HackerRank		Breadth First Search: Shortest Reach
	HackerRank		KnightL on a Chessboard
	SPOJ	KOZE	Sheep
	SPOJ	MAKEMAZE	VALIDATE THE MAZE

DFS	Object	Problem Number	Titles
	CodeForces	723D	Lakes in Berland
	SPOJ	ABCPATH	ABC Path
	SPOJ	BENEFACT	The Benefactor
	SPOJ	CAM5	Prayatna PR
	SPOJ	LASTSHOT	THE LAST SHOT

❖ **Link contest**
- ✓ *Link*

❖ **References**
- ✓ *BFS*
- ✓ *DFS*

WEEK 7 + 8

❖ **Content**
- *Data structures*
  ↳ Heap
- *Algorithm find shortest path in the weighted graph*
  ↳ Dijkstra

❖ **List of problems**

Heap	Object	Problem Number	Titles
	CodeChef	RRATING	Restaurant Rating
	CodeForces	681C	Heap Operations
	HackerRank		QHEAP1
	HackerRank		Find the Running Median
	SPOJ	ALLIZWEL	ALL IZZ WELL
	SPOJ	PRO	Promotion

Dijkstra	Object	Problem Number	Titles
	SPOJ	MICEMAZE	Mice and Maze
	SPOJ	SHPATH	The Shortest Path
	SPOJ	TRAFFICN	Traffic Network
	SPOJ	TRVCOST	Travelling cost
	UVA	10986	Sending email

❖ **Link contest**
- ✓ *Link*

❖ **References**
- ✓ *Heap*
- ✓ *Dijkstra*

WEEK 9 + 10

❖ **Content**

- *Algorithm find shortest path in the weighted graph*
  - Bellman Ford
  - Floyd Warshall

❖ **List of problems**

Bellman Ford	Object	Problem Number	Titles
	LightOJ	1074	Extended Traffic
	UVA	558	Wormholes
Floyd Warshall	UVA	10171	Meeting Prof. Miguel...
	UVA	10246	Asterix and Obelix
	UVA	10803	Thunder Mountain
	UVA	436	Arbitrage (II)
	UVA	567	Risk
	SPOJ	SOCIALNE	Possible Friends

❖ **Link contest**
  - ✓ *Link*
❖ **References**
  - ✓ *Bellman Ford*
  - ✓ *Floyd Warshall*